

# Example of finding the hidden treasure essay



**ASSIGN  
BUSTER**

## Maths Assignment

According to the given problem, Ahmed's map states that the treasure is  $2x+6$  steps away from the Castle Rock. At the same time, Vanessa's map states that the treasure is  $x$  steps north and then  $2x+4$  steps east. Analyzing the two statements, we get that, there are two paths to reach the treasure from the Castle Rock. One is  $x$  steps to the north from the starting point and then  $2x+4$  steps to the east and the other is  $2x+6$  steps from the Castle Rock. Only solution to this problem is that, Castle Rock and treasure form two vertices of a right angled triangle, with the paths of  $x$  and  $2x+4$  making 90 degrees and path of  $2x+6$  being the hypotenuse. So this is a problem on Pythagorean theorem.

### According to Pythagorean theorem,

$$x^2 + (2x + 4)^2 = (2x + 6)^2$$

### Solving this equation, we get,

$$x^2 + (4x^2 + 16x + 16) = (4x^2 + 24x + 36) \text{ [as } (a+b)^2 = a^2 + 2ab + b^2]$$

$$5x^2 + 16x + 16 = 4x^2 + 24x + 36$$

$$(5x^2 - 4x^2) + (16x - 24x) + (16 - 36)$$

### Hence, on solving, we end up getting a quadratic equation,

$$x^2 - 8x - 20 = 0$$

### Solving the quadratic equation, we get ,

$$x^2 - 10x + 2x - 20 = 0$$

$$\text{ie. } x(x-10) + 2(x-10) = 0$$

$$\text{ie. } (x-10)(x+2) = 0$$

**Solving according to zero factor property, we get a compound equation,**

$$(x-10)= 0 \text{ or } (x+2)= 0$$

So value of  $x= 10$  or  $x=(-2)$

If  $x= 10$ ,

**They will have to walk 10 steps to the north, 24 steps to the eastor 26 steps directly.**

But, if  $x= (-2)$ ,

Then they will have to walk 2 steps in south direction and  $2x-4$  ie. Zero steps in east , which contradicts the statement given in the problem.

So the best solution is  $x= 10$  steps.

**This solution can be reverse checked as well.**

The numbers 10, 24 and 26 should satisfy Pythagorean theorem.

$$(10)^2 + (24)^2 = 100 + 576$$

$$= 676$$

$$=(26)^2$$

Hence , to find the treasure, they have to walk 10 steps north and 24 steps to the east or 26 steps directly from Castle Rock.